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Factory Management

Addressing ourselves to this subject, we find we have recourse to lectures given by a dozen prominent industrialists and trade union leaders. A study of their pronouncements has materially reinforced our stock of funny stories, has informed us of the superiority of American production, but not necessarily of American management, has stressed the need for better employer-employee relations, but has given us nothing concrete. It is truthful to say that most of them would be admirable after-dinner speeches, but as cold contributions to the world's knowledge of management, they have made but a minimum addition. After the 1914-18 war, attention was given to management, but this was of a distinctly more useful type. Moreover, dissertations were given, not by overworked leaders of industry, but by technicians. Amongst the questions discussed were such subjects as rest pauses, welfare and safety measures, factory lighting, foremen with livers, rate-fixing, design, and, later, amenities. Now, the big noises are indulging in nebulous psychological reactions, which every factory executive well knows vary from shop to shop and from time to time. There have been, of course, many references to the establishment of joint production committees, the need for which may or may not exist in any particular establishment.

The ideal works' manager does not, and cannot, exist. The success of a manager depends on two factors, not one. Relations with the directorate and with the people he controls. For instance, one works' manager with a brilliant record transferred his employment to a somewhat smaller yet essentially modern establishment where he was a complete misfit. Then he moved again and with his new concern he was soon promoted managing director, and is now well qualified, except that he has not yet been knighted, to address association meetings on management. It can be presumed that the most successful manager is the one whose influence is felt when not actually present. Consider the example of an outstanding colliery manager; in this case his men are working in isolated small gangs with a minimum of supervision. No amount of "book learning" will create such a personality.

We well remember posing the question, "To what do you ascribe your success in life?" to those three great leaders of industry now deceased —Sir Robert Hadfield, Lord Hurst and Lord Melchett. The replies from each were virtually the same and were to the effect that their personal successes were due to their ability to pick "winners" as colleagues and staff. Much the same must apply to the successful manager.

The qualifications for a manager are quite simple. He must know the technical requirements of the unit he manages, be it a works or a department, and he must have the gift of leadership. The former he will acquire in the hard school of unremitting toil; the latter is innate. If a man has not this attribute, he will gain nothing from a study of all the outpouring of the "big noises," whilst if he does possess a natural qualification, he will be mildly amused. As the lectures by these great industrial leaders are published verbatim, we counsel them to restrict their activities to after-dinner speeches, as they are lowering their prestige by their appearance as lecturers.

Contents

Factory Management, 1.—Scottish Foundry School, 2.—Forthcoming Events, 2.—Foundry Drying Systems, 3.—Silicon Cast Iron for High Temperature Service, 9.—Book Review, 10.—Publications Received, 10.—Carding Machine Castings, 11.—New Catalogue, 11.—Gazette, 12—No Justification for State Steel, 13.—Personal, 13.—New Patents, 14.—Crompton Parkinson's Outlook, 14.—News in Brief, 15.—Amalgamation of B.O.T. Departments, 16.—Increases of Capital, 16.—New Trade Marks, 18.—Midland Industry's Fuel Saving, 18.—Company News, 20.—Obituary, 20.—Raw Material Markets, 22.—Human Relations in Industry, 22.—Recent Shipbuilding Orders, 22.

Scottish Foundry School

The sub-committee of the Joint Advisory Committee for Pre-Vocational and Apprenticeship Courses at Burnbank Foundry School, Falkirk, reported to Stirlingshire Education Committee recently that the Director of Education had submitted a letter from Mr. R. L. Hunter stating that he had discussed with his colleagues regarding the Foundry School and that they were all in agreement that the scheme should be reconsidered in the light of the difficulties of establishing pre-apprenticeship training. The letter added that there would still appear to be a very valuable use for the school in connection with apprenticeship training, *i.e.*, after the boy had actually begun his apprenticeship at one of the local foundries. Mr. Hunter had been in touch with the union officials, and understood that they were also in agreement.

A letter was also submitted from Mr. Ure, Divisional Organiser of the Amalgamated Union of Foundry Workers, stating that as a result of a conversation with Mr. Hunter he had again raised the matter of the proposed Foundry School at a meeting of his No. 1 District Committee. It was agreed that the inauguration of such a school (to operate concurrently with normal workshop training or apprenticeship) would hold some prospect of advancement for the young people of the district who entered the founding industry, and he was authorised accordingly to assist in any efforts undertaken with that end in view. This letter added that the training of young people was engaging the attention of industry generally, and several schemes had lately come to fruition. It would be advisable, therefore, to keep local requirements in view in that direction because of the preponderance of ironfounding.

Mr. Ure asked to be kept informed of any developments in the near future. After a long discussion, it was agreed that apprentices should attend for one day per week for 44 weeks. It was also agreed that the employers' representatives should have a meeting so as to obtain their general views, and that these views should be communicated to the Director of Education as soon as possible thereafter. It was further agreed that the employers would then get in touch with the Scottish Education Department regarding the provision of organised schemes for apprentices, and that the employers would advise the Director of Education which employers are prepared to come into the scheme and what number of apprentices would attend the school.

ON DECEMBER 1, 1948, it was 25 years since Mr. F. W. E. Spies, President of the Netherlands Association of Foundry Technicians, joined the staff of the Royal Netherlands Blast Furnace and Steel Works of which he is now works-director. Many of his friends were present to celebrate this anniversary with him. Representatives from the staff of the blast furnace and steelworks, the Netherlands' Association of Foundry Technicians and of various organisations concerned with safety in industry, in which Mr. Spies has always been very interested, spoke in appreciation of his work.

Forthcoming Events

(Secretaries are invited to send in notices of meetings, etc., for inclusion in this column.)

JANUARY 8.

Institution of Mechanical Engineers

Graduates' Section, London :—"Industrial Research and its Relation to Design and Production," by Sir F. Ewart Smith, M.A., at Storey's Gate, St. James' Park, London, S.W.1, at 3 p.m.

JANUARY 10.

Institute of British Foundrymen.

Sheffield Branch :—"Do You Use your Cost System," by R. L. Lee (American Exchange Paper), at the Royal Victoria Station Hotel, Sheffield, at 7.30 p.m.

JANUARY 11.

Slough Section :—"Some Special Examples of Light-Alloy Founding," by H. W. Keeble and Mr. Craven, in the Lecture Theatre, High Duty Alloys, Limited, Slough, at 7.15 p.m.

The Institute of Metals.

South Wales Local Section :—Films of Metallurgical Interest at the University College, Singleton Park, Swansea, at 6.30 p.m.

Institution of Production Engineers.

Birmingham Graduates' Section :—"How to Do It"—Problems answered by Industrialists, at the James Watt Memorial Institute, Great Charles Street, Birmingham, at 7 p.m.

JANUARY 12.

Institute of British Foundrymen.

Lancashire Branch :—"The Venting of Cores and Moulds," by D. Killingworth, at the Engineers' Club, Albert Square, Manchester, at 7 p.m.

Institute of Vitreous Enamellers

Southern Section :—"Methods of Application of Enamel," by H. McNair, at the Waldorf Hotel, London, W.C.2, at 7.15 p.m.

Spenborough Engineering Society

"Some Aspects of Works Maintenance," by H. E. Apps, at the Temperance Hall, Cleckheaton, at 7.30 p.m.

Institutions of Production Engineers

Sheffield Section :—"The Steel Company of Wales' Developments at Port Talbot," by W. F. Cartwright, at the Royal Victoria Station Hotel, Sheffield, at 6.30 p.m.

JANUARY 13.

Institute of British Foundrymen.

Lincoln Section :—"Some Problems of a Small Jobbing Foundry," by E. A. Phillips, at the Lincoln Technical College, at 7.15 p.m.

JANUARY 14.

Middlesbrough Branch :—"The Production of Basic Electric Steel for Castings," by L. Johnson, at the Cleveland Scientific and Technical Institute, Corporation Road, Middlesbrough, at 7.30 p.m.

Institution of Production Engineers.

Eastern Counties Section :—"Air-operated Fixtures," by N. P. Watts, at the Lecture Hall, Electric House, Ipswich, at 7.45 p.m.

Manchester Association of Engineers.

"Paper Making Machines," by G. H. Sheldon, M.I.Mech.E., at the Engineers' Club, Albert Square, Manchester, at 6.45 p.m.

JANUARY 15.

The Institute of British Foundrymen.

Birmingham Students' Section :—Visit to Works of Incandescent Heat Company, Limited, Smethwick, at 9.30 a.m.

A BUILDING AND ENGINEERING EXHIBITION (EQUIPMENT AND MATERIALS) will be staged at the Horticultural Hall, Westminster, London, S.W.1 from May 16 to May 27.

MR. TOM GRAHAM, engineer to the Hammond Lane Foundry Company, Limited, Dublin, has retired after 23 years' service. He was presented by his colleagues with a wireless set.

Foundry Drying Systems*

By John B. Morton†

(*Continued from Vol.* 85, *page* 626.)

To increase the capacity of a continuous-stove, simply-constructed extra trays were fitted, as shown in Fig. 11, allowing an extra five plates of 11 in. square per carrier. When an unusually large run of small simple cores were being made, the 18-in. by 12-in. plates were diverted to the racks of the batch system. Stoves of the above type are very economical with fuel, as there is very little "dead" space; the model illustrated burns only about 44 lb. of coke nuts per hr. Fig. 11 also shows how a bolt is screwed through the lug on the extra tray and used to attach it to the hollow chain-link.

Paste and Black-wash Drying

In conjunction with the above continuous core-drying system, there is the following operation of collecting, dressing, fitting and blackwashing the dried cores. Except for intricate built-up cores, the paste and black-wash of which are dried in cabinet-type gas-fired ovens, the bulk of the finished cores are passed, after black-washing, through a tunnel of infra-red lamps (Fig. 12). The conveyor is geared to allow the cores to pass through this 12 ft.-long tunnel of 108 lamps in seven minutes. Heat is by radiation only and penetration is not very deep, about $\frac{1}{8}$ to $\frac{1}{4}$ in., and any part of the core in shadow is not dried, this involving, in many cases, a double journey through the lamps. Electrical consumption of 27-kw. per hr. is heavy in comparison with drying efficiency and the bulb replacement loss is high. Furthermore, it is very difficult to keep the reflectors clean.

It is possible that this system could be utilised to a better advantage by the use of resistance elements similar to those of an electric fire instead of the infra-red lamp bulbs. Gas- or oil-fired low-temperature horizontal-tunnel ovens would be, however, far more satisfactory. Plans are now in progress to overcome the many disadvantages of the above-mentioned continuous-drying system. The chief aims are to reduce the amount of handling of cores, to obtain greater flexibility of stoving and a subsequent production increase.

The diagram in Fig. 13 depicts the proposed scheme. A pendulum conveyor carrying loose trays, which are loaded with cores from the double core-making benches, travels with intermittent timed stops to an automatic loading, vertical, single- or double-loop continuous stove; the automatic loader of the stove picks up a tray at one of the timed stops. The conveyor travels round a loop and picks up a tray of dried cores from the automatic unloader and conveys it past the pasteing and blackwashing benches. The cores are picked off, treated, and replaced on the conveyor to travel to another and smaller continuous vertical stove, which is speeded-up and run at a lower temperature. The loading and unloading of this stove is by hand; the dried completed cores then being finally passed to storage. Included in this system is a series of sand buckets, one on each pendulum. Sand is fed into these buckets from a hopper which is filled with conveyor-delivered sand from the sand mill. The timing of the conveyor and the positioning of the coremaking benches are arranged to allow a sand bucket to be tipped into the bench sand-trough by the coremaker. That, in brief outline, is the system which satisfies the foundryman's requirements. It is up to the engineers to make it possible.

Large Core- and Mould-drying Equipment

This can be classified into four main methods:—(1) bogie- or car-type stoves; (2) pit or underground stoves; (3) portable fireboxes for pit moulds, and (4) skin or hand-torch drying.

Bogie Types

Fig. 8 portrays a battery of large brick-built core stoves heated by dry-producer-type fireboxes, the gas entering from the back and leaving through flues in the floor at the front. The vertical-moving counterbalanced doors are superior for heat conservation than those which open outwards; they are much easier to open and less liable to be damaged. Unfortunately, where there is low headroom and overhead cranes have to pass, the ordinary door types have to be installed, unless, of course, the more expensive roll door is practicable. Fig. 14 (*a*) shows a normal type of rolling-axle bogie. As an alternative, bogies built with steel joists, as shown in Fig. 14 (*b*), may run on a flanged roller track, which itself is carried on sunken beams. The track is hinged to fold into the stove to allow the door to close, or it can be in two sections—one section remaining outside

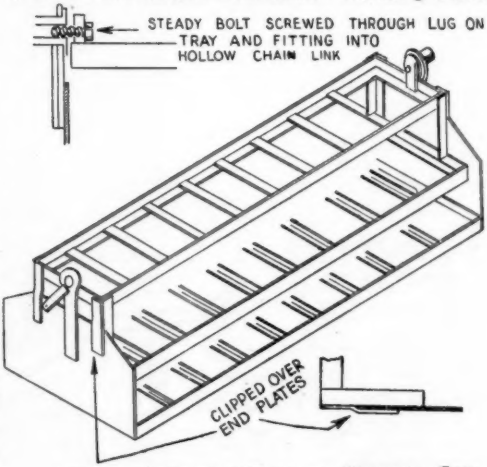

FIG. 11.—ADDITIONAL TRAY FOR VERTICAL, CONTINUOUS-TYPE CORE STOVE.

*A Paper read before the Scottish Branch of the Institute of British Foundrymen.

†This Paper gained for the Author the award of the John Surtees Gold Medal.

Foundry Drying Systems

the stove. Running the bogie into the stove is accomplished in this case by a hook which is cemented into the floor just inside the door. The loop at one end of a wire rope is hitched over this hook, passed under the bogie and around the pulley wheel on the front of the bogie, and so to the crane hook. By a straight lift and cross-travel movement, the bogie is pushed into the stove; the loop of the rope is then easily removed. This is a simple and very effective method. Pulling the bogie out is by cross-travel of the crane, the chains being fastened to hooks on the front of the bogie.

Fig. 15 shows a set of mould stoves, fired by re-circulation stoker-fed fireboxes, the gases entering at the back (one firebox for two chambers) and out by the re-circulation flues in the floor at the front. The doors in this case open outward, due to the low headroom, and are not a very good fit; the hinges have to be adjusted to prevent door sag and subsequent jamming. Also, much heat is lost to the other chamber if one chamber be drawn first, there being insufficient room for the doors to close. The bogies run on frictionless rolling-axle wheels (Fig. 14 (*a*)). However, it would be advantageous to harness the two axles together with a steel cradle with easy-fitting bearings on the axles to prevent the tendency of the wheels skewing and jamming. These bogies are drawn out by a rope fastened to a hook at the front and passed round a pulley in the floor, and so to the crane. The floor pulley is hinged to fold into the floor, the hole being covered with a plate when not used. Fig. 14 (*a*) also shows the method of returning the bogie into the oven, the pulley inside the door and stove having an easily-removable spindle in order that the rope may be passed round the pulley before putting it into place and *vice versa* for removing the rope.

FIG. 12.—TUNNEL OF INFRA-RED LAMPS FOR BLACK-WASH DRYING.

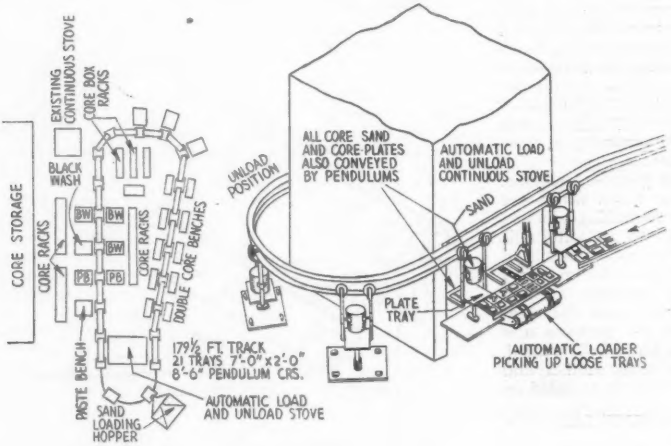

FIG. 13.—PROPOSED SYSTEM FOR CONTINUOUS CORE MAKING AND DRYING, (RIGHT) ARRANGEMENT AT THE MAIN STOVE, (LEFT) FLOOR PLAN.

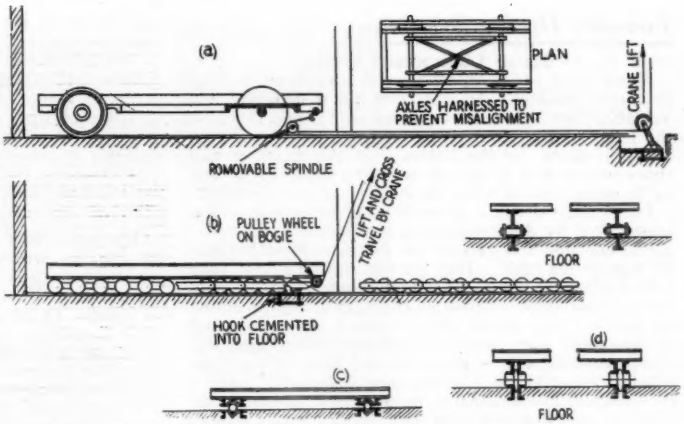

FIG. 14.—(*a*) ROLLING-AXLE BOGIE, (*b*) FLANGED ROLLER-TRACK BOGIE, (*c*) BALL-BEARING TRACK, AND (*d*) GROOVED ROLLER TRACK.

Ball-bearing Tracks and Grooved Tracks

Ball-bearing types of bogie track (Fig. 14 (*c*)) consist in the placing of iron or steel balls in V-tracks in the floor, the bogie having inverted V-tracks fitting over the balls. A possible disadvantage of this type, although it is smooth and frictionless, is the likely tendency of the bogie to ride or climb sideways over the balls, especially if the pull-out gear is not central, or if the load on the bogie is unbalanced. The grooved-track roller (Fig. 14 (*d*) would tend to counteract the riding-off effect of the balls and still maintain a frictionless rolling bearing, although it would be necessary to keep the grooves in the floor free from sand and dirt. The use of roller or ball tracks reduces the height of the bogie and, therefore, gives greater effective capacity in the stove.

Where a separate motor and haulage gear can be fitted, it saves heavy and sometimes excessive loads on the overhead crane, especially of the cross-travel crab for manipulation of the bogies out and in. This operation can be accomplished by a rope, one end fastened to the front of the bogie, passed around a winch and around pulleys inside the stove to the rear of the bogie. This method would only be convenient if the bogie top were covered and heat-inlets and outlets were above this level so as to prevent the ropes being damaged by heat. This type of haulage is common in annealing stoves.

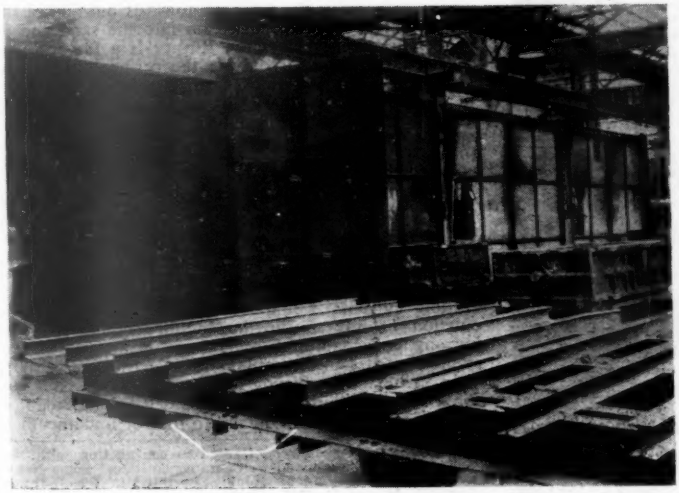

FIG. 15.—BATTERY OF FOUR MOULD-DRYING STOVES FIRED BY TWO RE-CIRCULATION FIREBOXES. NOTE: ROLLING AXLE BOGIE.

Foundry Drying Systems

Pit or Underground Stoves

These types of stoves offer some advantages in large dry-sand foundries. An important one is that they save valuable floor space as compared with bogie types, as the latter need a similar area in front of the stove on which to draw out the bogies, this area being wasted space except that it may possibly be used for closing or finishing moulds when the bogies are in the stove.

Fig. 7 (left) shows a diagrammatic twin layout of pit stoves fired by dry producer fireboxes, the gases entering at one side and passing out through adjustable outlet flues on the other. They are built into the floor, with a thick air-spaced lining of refractory brick and a cement floor; loose steel cover-supports form a bridge across the centre. The covers (Fig. 7 (right)) are constructed of structural steel with an asbestos lining, and are totally covered with sheet metal and have lifting rings fitted at the corners. Angles around the underside of the covers fit into channel sections around the stove tops and the joint is sealed with loose sand. When a stove is being loaded or unloaded, the cover is placed on the top of an adjoining stove and is, therefore, not taking up any extra space. Fig. 17 shows a layout of four covered pit stoves with hopper-fed fireboxes at each side, and Fig. 16 shows the inside of a stove containing the cope and drawbacks of a mould for a large crankcase.

FIG. 16.—PIT STOVE, WITH COVER REMOVED, SHOWING HALF-MOULD AND DRAWBACKS FOR A LARGE CRANKCASE.

The advantages of pit stoves can be summarised as follow:—(1) They save floor space; (2) are easily loaded direct by crane; (3) allow full use to be made of capacity, and (4) there is reduced heat loss by radiation from walls. After drying, and with the covers removed, about one day is required for cooling down the contents before handling, but there again no further floor space is used and moulds can be removed as and when required.

Portable Driers

The day is past when large moulds made in the floor have to be dried by braziers, and compact units are now available to carry out this drying operation faster and more efficiently with a saving of fuel and a reduction of fumes. In fact, the tendency is now towards the use of re-circulation fireboxes, the top of the mould being sealed off with steel plates or asbestos sheet. The inlet from the firebox is carried well down into the mould and the rising gases are re-circulated over the fire again. It is very useful to have provision made in a portable drier for three or four gas outlets; for instance; one through each side, the top, and the bottom. Those not required are blanked off, thereby increasing the number of positions from which hot gases can be led into a mould.

Skin Drying

This type of drying has been given much publicity in the past few years and shows many advantages. Needless to say, if skin drying could be adequately applied, it would speed up production to a considerable extent, especially if used in conjunction with a mechanised moulding plant.

The application of flame heat from a hand-torch has the same defect of the earlier types of drying stoves, and that is, the slow circulation of the heat over the sand surfaces increases the tendency towards burning of the mould and the passage of steam into the sand and its condensation just below the surface is a factor to be considered. Thus not only is the permeability of the sand decreased, but quick casting is necessary before the moisture comes back to the surface.* It is suggested that if hot air could be passed swiftly over the sand surfaces, in the same manner as in circulating stoves, the drying effect would be deeper and the tendency to burning would be reduced.

For example (as shown in Fig. 18 (*a*), (*b*) and (*c*)), if a thin metal former, cast roughly to the shape of the mould interior, were placed over the mould (allowing a space between the former and the sand surfaces), and heat was applied by a hand-torch on the outside of the former (Fig. 18 (*b*)), then convection currents would be set up, creating a circulation of hot air in the mould without risk of burning. Secondly, if some form of hot-air blower could be designed similar to electric hair-driers, but capable of producing a large volume of hot gas about 300 to 400 deg. F (150 to 205 deg. C.) and adapted to blow through a hole in the former or underneath it

*This statement should be studied in conjunction with the Paper by A. Cracknell and F. Cousans, entitled "Some Notes on the Surface Drying of Moulds," printed in the JOURNAL, August 7, 14 and 21, 1947.—EDITOR.

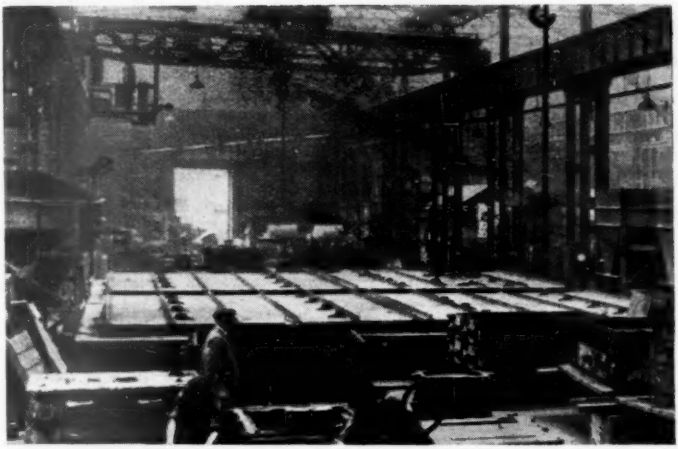

FIG. 17.—BATTERY OF FOUR PIT STOVES, SHOWING THE ROOF-SECTIONS IN POSITION.

(Figs. 18 (*a*) and 18 (*c*)), the velocity of the gas would speed up heat transfer and drive off the steam evolved. In a mechanised plant dealing with a large number of similar moulds, this suggestion could possibly be developed. For instance, the blower unit could be fixed to the former, which could be operated by a swivel arrangement to cover in turn moulds travelling on a conveyor.

For hand-drying equipment, a paraffin pressure set produces a very hot flame of about 10 to 12 in. long. It is handy for drying patches on dry-sand moulds, but is inclined to be too fierce for skin drying; in fact, if not correctly handled, there is a tendency for rolling up of the green-sand surface by the force of the flame. A second type is a propane-burning outfit. The hand-torch is locally designed and patented. This is a very convenient set, producing a long, clean, soft, yet very hot, flame and is easily lit and controlled. It was used with some success recently in the skin drying of large-surface green-sand moulds which were faced with powdered resin, the softness of the flame eliminating the possibility of the resin rolling up into bubbles. Unfortunately, the difficulty in getting containers and supplies of propane gas prohibits its general use. The most common hand-torch for general purposes, such as drying of moulds and for core repairs, is the coal-gas/compressed-air type, but here again the lack of gas pressure locally can limit its use.

Ladle Driers

Ladle drying is very often a neglected process. The incorrect drying of ladles can lead to many troubles, not only because of the cooling down of the metal, but also because unburned particles of soot can cause gassing of the metal. There are many well-designed and efficient units on the market, using either coke, coal gas or fuel oil for combustion. The solid-fuel units (Fig. 19 (*b*)) are usually forced-draft fireboxes, the products of combustion passing through the top conical surface into the inverted ladle, passing back through the outer shell of the drier to a stack *via* an exhaust flue. The fuel-oil/air type, illustrated in Fig. 19 (*a*), is clean, easily maintained and very efficient; the velocity of the products of combustion from the burner nozzle greatly aids the heat transfer.

Conclusion

Although the design of stove and drying apparatus embodying a high degree of thermal efficiency is well taken care of by competent manufacturers, only the foundryman himself can judge what is best for his particular class of work. For instance, a well-built, super-efficient drying stove is but a white elephant if a haphazard system of control, such as would be typified by inefficient methods of transporting and feeding fuel and difficulty in getting "green" material in and "dry" out, were used, or if there were poor flow of the products through the system. If a system be decided upon,

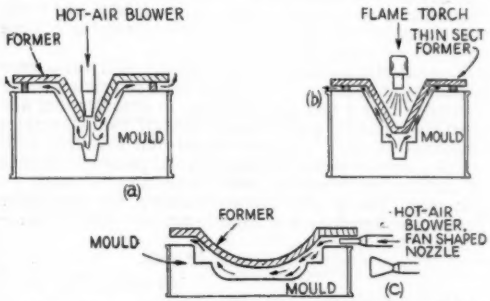

FIG. 18.—SURFACE DRYING METHODS, (*a*) AND (*c*) USING HOT AIR, (*b*) USING A TORCH FLAME.

Foundry Drying Systems

whether batch or continuous, the correct design of stoving equipment should be settled first and the production flow should be planned to suit. It is advisable, especially in continuous drying plant for cores, to allow a generous margin in the maximum capacity, even at increased expense, because it is worth remembering that stoves of this type cannot be speeded up beyond their designed rate if efficient drying is to be maintained.

In older foundries with out-of-date drying plant, but with modern production problems, modifications and conversions can form a worth-while basis for expenditure. The efficiency of existing stoves can be increased by sealing-off air leaks, by adding to the insulation of walls, roof and doors of ovens and, above all, by introducing re-circulation into the firing system.

Permission by his employers to produce this Paper is gratefully acknowledged by the Author.

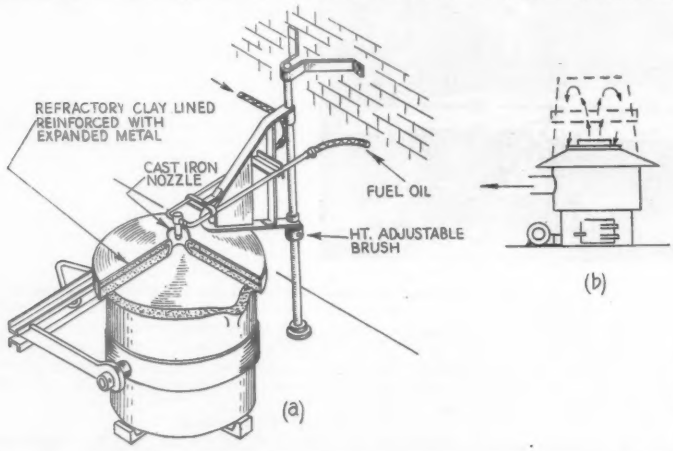

FIG. 19.—LADLE DRIERS, (*a*) FUEL-OIL FIRED, (*b*) SOLID-FUEL FIRED.

Correspondence

[We accept no responsibility for the statements made or the opinions expressed by our correspondents.]

MAGNESIUM CASTINGS

To the Editor of the FOUNDRY TRADE JOURNAL

SIR,—Referring to your editorial survey of 1948 appearing in your issue of December 30, I note that, in reference to magnesium light-alloy foundries, the statement appears that they "still have to rely to a large extent on the aircraft industry."

The aircraft industry is, and always will be, a prominent user of magnesium alloys until something better appears. It is a mistake, however, to consider that aircraft consume the greater proportion of the magnesium foundries' output. The two magnesium foundries with which I am connected produce several hundreds of tons of castings per month, of which only approximately 20 per cent. goes to the aircraft industry, the remainder being distributed over a wide range of applications.—Yours, etc.,

E. PLAYER,
Managing Director.

Birmid Industries, Limited.
January 3, 1949.

Forty Years Ago

THE FOUNDRY TRADE JOURNAL for January, 1909, commences by listing the four Branches of the British Foundrymen's Association:—Manchester, Birmingham, Cardiff and Sheffield, and contains a full length report of the first meeting of the Institute of Metals, which opened with a message of greeting from the president of the American Brassfounders' Association, Mr. W. M. Corse. One of the main articles was devoted to the installation in Germany of a Stassano electric furnace for the making of steel castings. It operated at a current consumption of between 800 and 1,000 units per ton. Then there is a description of a fully mechanised sand-preparing plant. The use of belt conveyors is, however, queried as being unsuitable! From a Paper read by Professor Turner, who happily is still active, one learns that aluminium bronze was introduced as a special alloy some 30 years previously.

DR. HAROLD HARTLEY has been appointed chairman of Radiation, Limited, in succession to Mr. J. F. Davies, who on December 31 retired from the board. Dr. Hartley is very well known in ironfoundry circles; he is a past-president of the British Cast Iron Research Association.

Silicon Cast Iron for High-temperature Service*

Cast-iron parts subjected to service at elevated temperatures frequently fail because they undergo permanent volume increases, commonly called growth, with an accompanying loss in strength. This is especially true when the parts are alternately heated and cooled. The warping and buckling of stove plates, furnace bowls, furnace grate bars, burners, and the heat checking in permanent moulds used in the foundry and glass industries are typical examples of this type of failure.

Numerous alloy cast irons have been developed which are not subject to growth. However, such cast irons are quite costly and in many cases cannot be made in the average small foundry. The high-silicon cast irons developed by the British Cast Iron Research Association, prior to 1928, are a notable exception. These irons, containing over 4 per cent. Si, are quite resistant to growth, are only slightly more costly than ordinary grey iron and can be made in the average small foundry. It has been the object of the present investigation to verify the claims made for these irons, and to develop a technique for their economical production.

Earlier investigators have shown that growth of ordinary (*i.e.*, low silicon) cast iron occurs in two stages. The first stage or primary growth occurs when iron carbide graphitises below the Ac_1 temperature. This growth represents the difference in volume between iron carbide and its products of decomposition, ferrite plus graphite. Obviously this volume increase is slight and causes trouble only when close tolerances must be maintained. The second stage or secondary growth is the result of severe transformation stresses which occur when the cast-iron object passes through the critical temperature range. These stresses actually exceed the strength of the iron and consequently microscopic cracks are formed. The presence of oxiding gases which form scale in these cracks accelerates secondary growth.

Growth Testing

A comparison between the growth characteristics of ordinary grey iron and high-silicon cast iron is shown by the growth curves in Fig. 1. In these tests each cycle consisted of heating test-bars to 900 deg. C., holding at that temperature for 4 hr., followed by air cooling to room temperature. The ordinary grey iron grew approximately 8 per cent. in 41 cycles while high-silicon cast irons suffered practically no length change.

Short stainless-steel studs were attached to the ends of the bars used for the tests before they were subjected to the cyclic heating. All length measurements were made between the ends of these studs; thus the presence of adherent scale or loose flaky scale had no effect upon the length measurements. Bar A (an ordinary grey iron) was coated with a heavy skin of tightly adherent scale. Bar B (an unalloyed 6 per cent. Si iron) scaled to about the same degree; however, in this case the scale flaked off after each cooling cycle. Bar C, containing approximately 6 per cent. Si, 0.5 per cent. Cr and between 1¼ and 1½ per cent. Cu, was highly resistant to scaling. Patent protection covering this development is being sought.

*Abstracted from an article by W. H. White and A. R. Elsea, appearing in "The Iron Age."

Brittleness

Silicon cast irons have hitherto been used very little partly because they have a reputation of being extremely brittle. Irons containing 6 per cent. Si are quite brittle at room temperature, the temperature at which cast iron is usually tested. From comparitive curves representing impact strength against temperature for an ordinary grey iron and for a cast iron containing 6 per cent. silicon, it is apparent that brittleness of the high-silicon irons is a problem only at relatively low temperatures. At all temperatures above 260 deg. C., high-silicon iron has greater impact resistance than ordinary grey iron.

Silicon iron castings can be made in the average small foundry since the iron can be melted in the cupola. The charge should contain approximately 0.5 per cent. more silicon than desired in the final casting to allow for melting losses. The high silicon content

(*Concluded on page* 10 *at the foot of col.* 2.)

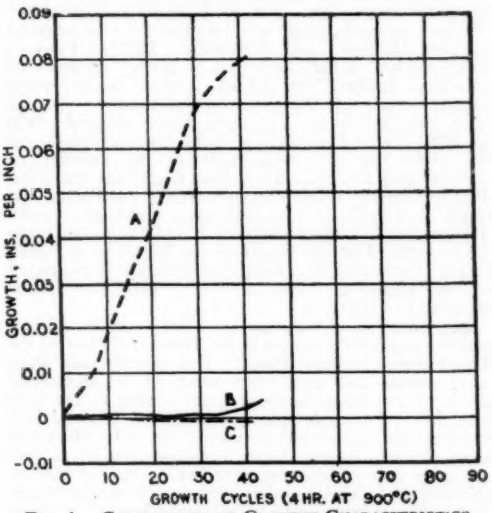

FIG. 1.—COMPARISON OF GROWTH CHARACTERISTICS OF GREY IRON (A) AND SILICON IRONS (B) AND (C).

Type.	Compositions, per cent.:—			
	Carbon.	Silicon.	Chromium.	Copper.
A	3.01	1.86	—	—
B.	2.30 to 2.67	5.62 to 6.71	—	—
C.	2.20	6.22	0.49	1.32

Book Review

A History of Cast Iron in Architecture. By John Gloag and Derek Bridgwater. Published by George Allen & Unwin, Limited, Ruskin House, 40, Museum Street, London, W.C.1. Price 63s. net.

Much importance is rightly attached by enlightened industrialists to what is known as "prestige publicity." This being the case, then the ironfoundry industry should benefit very materially from the appearance of this book. It is completely devoid of "austerity"; actually it is magnificently illustrated and well printed in large clear type. Moreover, it is embellished with half a dozen coloured plates. There are over 500 illustrations, which should be ample for satisfying the architect as to the use (as well as mis-use) and versatility of cast iron as a medium for the exercise of his profession. The authors have well covered their subject in five chapters, preceded by a historical survey of the genesis and early developments in the art of making iron castings. For their first chapter they have chosen the period 1650 to 1750 and have given it the caption "The Cast Iron Industry becomes Established." It gives an excellent picture of what were at that time the nation's greatest industrial enterprises, as machine shops were only just making their appearance. It was a formative age, and Section II, "The New Material in Architecture: The Rise of Cast Iron: 1750-1820," discloses how advantage was taken of the new material by civil engineers and architects. Thomas Farnolls Pritchard has, if the claim that he is the "Inventor of Cast-Iron Bridges" be correct, a more worthy place in the annals of foundry practice than has so far been accorded him. The third period selected—1820 to 1860—covers the creation of the railway system and the great use that was made in the building of stations and bridges. Then, too, there was the great 1851 exhibition, which, through the Crystal Palace, did much to popularise cast iron as a building medium. The material, lending itself as it did to ornate treatment, suffered at the hands of the Victorian designer, and it is probable that, even to-day, it is still associated in the minds of some architects with the artistic banalities of that era.

Section IV covers the period 1860 to 1900 and carries the caption "Changes in the Industry following the Development of New Uses." This was the age when steel ousted cast iron from some of its traditional uses. There were, however, new outlets in the construction of seaside piers, whilst the demand for builders' and municipal castings increased. Here and there, better designs began to show themselves, but the general level was distinctly low. There seemed at this time to be an important overseas market for ornate cast-iron constructions. The final chapter—"Twentieth Century Developments"—shows how there has been a general "tidying-up" consonant with the functional potentialities of cast iron. Of great significance is the colouring by vitreous enamelling. This section, too, tells something of the manufacturing conditions under which the alloy is produced. It is a pity that the captions for Figs. 499 and 500 should contain the misprint "moulding and" instead of "moulding sand."

This book now holds the pride of place in the literature of cast iron, on account of the high level of its production, its intrinsic worth as a textbook and its profuse illustration. Though written primarily for architects, it also carries many lessons in industrial design worthy of profound study by ironfounders.

V. C. F.

Publications Received

Birlecomedy—Meltum in Parvo. Published for Christmas by Birlec, Limited, Tyburn Road, Erdington, Birmingham, 24.

The reviewer, as a pioneer in the electric furnace "game," possibly gets more amusement from reading these annual stories from Birlec, but who could not appreciate the assumption of a cloak of dignity by wrapping up one's chips in a copy of "The Times"? This essay on the dignity of melting plant is truly an excellent example of English humour at its best, and recipients can indeed count themselves fortunate.

Safety in the Works. Published by the Birmingham and District Industrial Safety Group, c/o Bakelite, Limited, Redfern Road, Birmingham, 11. Price 1s.

This is a thoroughly good textbook on the phases of safety related to the industrial plant and activities covered, and it is hoped that the response from the public will encourage the "group" to continue the work into further aspects. The contents of this issue include three finalised codes:—(1) Entry into tanks, vats, pits, etc.; (2) construction and maintenance of floors, passages, stairs and ladders; and (3) rules for crane drivers. Then there is a review of the Factory Act of 1937, supplemented by articles on Personal Protective Appliances; Ropes; Hand Tools and Guards for Milling Machines.

MR. P. H. WILSON, O.B.E., deputy managing director, Stanton Ironworks Company, Limited, and a past president of the Institute of British Foundrymen, has become a member of the Worshipful Company of Founders and a Freeman of the City of London.

Silicon Cast Iron

(*Continued from previous page.*)

in the charge can be obtained from the use of silvery or siliceous pig-iron. The carbon content of the charge should be as low as practical, melting should be rapid and the metal should be tapped from the hearth as soon as possible after melting in order to obtain the desired low carbon content. Additions of copper and chromium can be made in the ladle. The resistance to growth, scaling and impact at elevated temperatures of a cast iron containing 6 per cent. Si, 0 5 per cent. Cr and 1.25 per cent. Cu, coupled with the fact that it can be melted and cast in the average small foundry, should make this iron quite useful for parts subjected to high temperatures.

Carding Machine Castings

In our issue of October 28, 1948, we published a query from Mr. Cheng, a foundryman in China, who was concerned with blowholes he was getting in carding machine drum castings. As numerous replies were received, they were passed to Mr. W. Wilson, of Western Foundries, for collation; what follows is his composite report:—

An analysis of the replies to your correspondent concurs with other opinions I have solicited in that the troubles experienced are due mainly to pouring conditions. From the sketches and description given by the correspondent it is apparent that in his present method, Fig. 1 (*a*), he is using bottom pouring at rather slow speed for these castings. The section of the casting is only $\frac{5}{8}$ in., and with metal entering quite slowly from the bottom it is suggested that the metal higher up in the mould becomes cool and pasty and in this condition entraps gases evolved from the upper part of the mould. Foundry practice in this country leads more to top pouring from pencil drop gates through the feeding head, as shown by two different methods in replies from Mr. Gilmour and Mr. Butler. Instead of several ladles, practice suggests that a common pouring basin or runner bowl with sufficiently large evenly spaced down-gates would be more satisfactory in giving homogeneous metal composition and higher metal temperature in the casting as poured.

Slight modification of the pattern would enable the complete job to be rammed up in a composite whole with the joints at appropriate places to facilitate coring and handling, as can be followed from Fig. 1 (*b*).

The main core, as can be seen, has been extended through the runner core to form a runner ring, with the extended pattern, into which the down-gates have been entered. The method quoted by Mr. Rogers, which was contained in a Paper given by Mr. E. Longden some 20 years ago (Proceedings of the Institute of British Foundrymen, 1928-9, pages 828-834) conforms generally with the above description. It is essential to have a rapid pour with hot metal, whilst a head of approximately one inch per foot is generally allowed for parting off on machining.

Core Making

Production cores can be manufactured in several ways, to suit the particular foundry, based on wet-loam build-up, green sand, dry sand or oil sand. From the letter of Mr. Cheng it would appear that he is already familiar with the usual strickle-board methods suggested by one correspondent. Several correspondents seem to neglect the fact that Mr. Cheng already has "cages" or core barrels available, and using these enables venting of the core to take place together with a saving on sand and labour.

Mr. Longden's method, previously quoted, uses no straw-rope base for the core. Instead, a one-inch loam-sand face is strickled in a horizontal position on to a perforated core-barrel made up of four cast-iron segments. These segments are in turn mounted on a special cast-iron "spider." The arrangement is such that, 5 minutes after casting, the central spider can be knocked out to release the segments and permit unhindered contraction of the casting. While the core-barrel segments were still warm it was said to be possible to re-assemble them and strickle-up another core in 20 minutes or so for a second casting.

New Catalogue

Melting Furnaces. Sklenar Furnaces, Limited, East Moors Road, Cardiff, have sent us a 24-page brochure having a well-designed cover carrying the caption "Efficiency in Melting—The Sklenar Way." The reviewer believes a mistake has been made in the binding, which consists of a knot of coloured thread running through three perforations, as it prevents the book from opening nicely and, secondly, it is insufficiently strong. The brochure describes in considerable detail the potential advantages, melting technique and method of operation of a wide range of oil-, gas-, or coke-fired furnaces of the non-crucible type. The data are nicely set out in relation to capacity and material to be melted. Into this latter category enter all alloys whose melting points range between the light alloys and cast iron. The brochure is available to readers on writing to Cardiff.

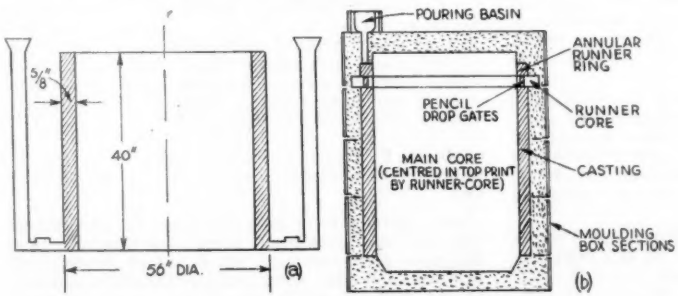

FIG. 1.—METHODS FOR MAKING CARDING MACHINE DRUM CASTINGS. (*a*) ORIGINAL METHOD USING BOTTOM POURING. (*b*) SUGGESTED METHOD USING DROP-GATES FROM A TOP RUNNER RING.

Gazette

OLD PARK FORGE, LIMITED, is being wound up voluntarily. Mr. W. E. Moore, 19, Paradise Square, Sheffield, 1, is the liquidator.

TODBURN STEEL, LIMITED, is being wound up voluntarily. Mr. R. P. Winter, 16, Market Street, Newcastle-upon-Tyne, is the liquidator.

SUPER WELDING (CLAYTON), LIMITED, is being wound up voluntarily. Mr. A. T. Eaves, 47, Mosley Street, Manchester, is the liquidator.

BELLOW MACHINE COMPANY, LIMITED, is being wound up voluntarily. Mr. F. P. Bleach, Atlas Chambers, King Street, Leeds, is the liquidator.

INTEX ENGINEERING COMPANY, LIMITED, is being wound up voluntarily. Mr. G. M. Todd, 17, Half Moon Street, London, W.1, is the liquidator.

GEORGE PATENT METAL BOX, LIMITED, is being wound up voluntarily. Mr. C. T. Stephens, 20, Westgate Chambers, Newport, Mon, is the liquidator.

HIDUMINIUM (BRITISH EXPORTS), LIMITED, is being wound up voluntarily. Mr. J. T. Lewis, 106, Edmund Street, Birmingham, is the liquidator.

THE PARTNERSHIP BETWEEN Edmund Spence, Fred Taylor Teale and Dick Bateson Teale, carrying on business as repairers and servicers of excavators, Diesel engines, etc., at Baron Close Works, Elland Road, Leeds, under the style of Contractors Plant Repair Service, has been dissolved.

THE PARTNERSHIP BETWEEN Leonard Douglas Lewery, 39, Fourth Avenue, Denville, Hants, and Frank Elliott, 29, Festing Grove, Southsea, Portsmouth, carrying on business as manufacturing precision engineers at 34, Seymour Street, Portsmouth, under the style of Lewery & Elliott, has been dissolved.

THE PARTNERSHIP BETWEEN Ronald Anthony Rosa, John Bramford Wilson and Arthur Vince Jones, carrying on business as general engineers at Church Street, Bilston, Staffs, under the style of the Central Engineering Company, has been dissolved. Debts will be received and paid by R. A. Rosa and J. B. Wilson, who continue.

THE RESOLUTION for liquidation and for the appointment of a liquidator for Union Lead Works, Limited (as advertised in the "London Gazette" on August 20, 1948, and published in the JOURNAL for September 2, 1948), has been ascertained not to have been validly passed and, accordingly, the company is not in liquidation.

THE PARTNERSHIP BETWEEN Ronald Joseph Richard Bakewell and Peter Harbot, carrying on business as engineers at Abbey Gate, Leicester, under the style of R. B. Modern Engineering Company, and at Devonshire Road, Leicester, under the style of Bakewell's Machines, has been dissolved. Debts will be received and paid by P. Harbot.

THE PARTNERSHIP BETWEEN John Walker and Thomas George Ward, carrying on business as lock manufacturers at Fox's Lane, Lower Stafford Street, Wolverhampton, under the style of Walker Ward Accessories, has been dissolved. Debts will be received and paid by T. G. Ward, who continues under the style of Ward Accessories.

THE PARTNERSHIP BETWEEN George Geoffrey Riggott, Richard George Head and Henry John Miller, carrying on business as public-works and constructional engineers, etc., at The Hawthornes, High Street, Castle Donington, Leics, under the style of Head, Riggott & Miller, has been dissolved. Debts will be received and paid by G. G. Riggott, who continues.

THE PARTNERSHIP BETWEEN James Pritchard Scarth Pillans and James Frederick Tilney, carrying on business as consulting and supervising engineers, at 99, Abbey House, and 2-6, Victoria Street, Westminster, London, S.W.1, under the style of Pillans Tilney & Partners, has been dissolved. Debts will be received and paid by J. P. S. Pillans and J. F. Tilney.

THE PARTNERSHIP BETWEEN Henry Michael Hamlyn, Hessle, East Riding of Yorks, and Peter Hamlyn and Kenneth Other Wilson, Kingston-upon-Hull, carrying on business as electro-platers at 11A, Grimston Street, Kingston-upon-Hull, under the style of A. E. Hare & Company, has been dissolved. Debts will be received and paid by P. Hamlyn and K. O. Wilson, who continue.

THE PARTNERSHIP BETWEEN Maurice Norman Mitchell, Albert Sidney Bolton, Frank James Carter and Florence Helena Mitchell, carrying on business as precision engineers and instrument makers at 45-47, Park Road East, Acton, London, W.3, under the style of M. & B. Engineering, has been dissolved. Debts will be received and paid by M. N. Mitchell, F. J. Carter and F. H. Mitchell, who continue.

THE COMPANIES' REGISTRATION OFFICE gives notice that the undermentioned companies have been struck off the register and are thereby dissolved:—National Federation of Manufacturing Engineers, Limited; Nordia, Limited; Thiray Engineering Company, Limited; Vanity Glass & Engineering Company, Limited; Warrington Woven Wire Company, Limited; West Cheshire Welding Company, Limited; Beeston Hopps Furnace Company, Limited; Portman Electrical Engineering Company, Limited; Pratt Forges, Limited; William Buckland, Limited; Fuelsaver Cylinder Heads, Limited; Robros Steel Company, Limited; Tomloy Chemical & Engineering Company, Limited; Benhil Machinery Company, Limited; H.P.W. Development Engineers, Limited; Harper Engineering & Constructional Company, Limited; Hydraulic Power & Alluvial Mining Syndicate, Limited; Marcon Machine Company, Limited; North Staffs Sheet Metal & Construction Company, Limited; Richardsons Button Machinery & Button Manufacturing Company, Limited; Sidney Smith Engineering Company, Limited; Wembley Toolmakers & General Engineering Company, Limited.

MR. A. L. BONEHILL, resident engineer of the British Industries Fair, Castle Bromwich, died on Christmas Day.

RESPONSIBILITY for glass sand and foundry moulding sand has now been transferred from the Raw Materials Department of the Board of Trade to the Ministry of Works. Any inquiries should be addressed to the Ministry of Works, B.M.3, Lambeth Bridge House, Albert Embankment, London, S.E.1.

No Justification for State Steel

Mr. J. H. B. Forster's Remarks

"Your board is unanimously opposed to State control of industry where no good reason exists for such an upheaval, and the proposal of the Government to nationalise a successful industry of the magnitude, importance and complexity of the iron and steel industry is, in the opinion of your board, without justification and against the welfare of the nation," said Mr. J. H. B. Forster, chairman of the South Durham Steel & Iron Company, Limited, in the course of his speech at the company's annual meeting on December 22. He told shareholders that under the terms of the Bill, at present before Parliament, the State would acquire not only the blast furnaces, steel plants and rolling mills of their companies, but would also become engaged on a considerable scale in the manufacture of steel pipes, structural steel work, steel tanks and a large range of engineering products.

"It is our belief that in the event of this Bill becoming an Act, the dead hand of State control would rapidly throttle all the initiative and enterprise shown by the industry which has enabled record outputs of steel during the present year to be achieved," he continued. "In our opinion there is no justification for considering that output as a result of State control would be increased, and if the example of other industries run under the bureaucratic method of State management be taken as evidence, the result would show the opposite trend. An underlying suggestion in the Bill that individual companies, though wholly owned by the State, would continue to retain their separate entities, is meaningless inasmuch as we are convinced the incentive which results from competition would cease to exist."

Economic Crisis

Mr. Forster said that if in effect the compulsory acquisition by the State of this industry should be the cause of an ultimate increase in costs of production on a similar scale to that experienced under State control in the coal and coke trades, then this country was faced with the gravest economic crisis in its history.

During last year the heavy and light plate mills and sheet mills had produced a record output for the West Hartlepool works. The British Iron and Steel Federation had given its approval to a scheme for the West Hartlepool works which would ensure pig-iron production for many years to come and the production of ingots, plates and sheets for an indefinite period. Under the measure of consultation and co-operation which had existed between the B.I.S.F. and the Iron and Steel Board for just over the last two years, this scheme was having the active consideration of the Iron and Steel Board. Under the scheme, ingot production for plate manufacture would be concentrated at the West Hartlepool works, and approval had been given to improve certain portions of the mills to obtain an even larger output of plates. The estimated cost of these schemes amounted to £1½ million.

Personal

MR. P. J. HOULTON has resigned his position as supervising engineer with F. H. Wheeler (Sheffield), Limited, electrical and mechanical engineers and contractors.

MR. ANTHONY EDEN has resigned from the board of the Rio Tinto Company, Limited, copper smelters and iron-ore merchants, of Port Talbot, Glam, owing to pressure of other duties.

MR. ROBERT RAINIE, of Harland & Wolff, Limited, London, has been appointed, for the third year in succession, chairman of the River Thames Dry Dock Proprietors' and Shiprepairers' Association.

MR. HARRY BECK, who retired at Christmas after 49 years' service with Ley's Malleable Castings Company, Limited, Derby, received a presentation to mark the occasion. For 31 years he has been foundry foreman.

MR. J. MITCHELL, machine-shop manager, MR. A. FLINT, manager of the steel appropriation department, MR. F. G. BELL, chief engineer, and MR. R. CLIFTON, forging-department manager, have received presentations to mark their recent retirements from Brown Bayley's Steel Works, Limited, Sheffield.

SIR GREVILLE MAGINESS, chairman and managing director of the Churchill Machine Tool Company, Limited, Manchester, chairman of Associated British Machine Toolmakers, Limited, and deputy chairman of Tube Investments, Limited, has been re-elected president of the British Employers' Confederation. SIR FREDERICK BAIN, president of the F.B.I., has been elected vice-president of the Confederation.

SIR WILLIAM COATES has tendered his resignation from the Economic Planning Board, and it has been accepted by the Chancellor of the Exchequer. Sir William was one of the three members nominated for appointment to the Board in 1947 by the Federation of British Industries and the British Employers' Confederation. The Treasury states that Sir William's resignation is in view of his recent departure for a long visit to Australasia.

MR. E. A. VALDES, MR. K. E. SUMMERS and MR. S. G. HOWARD have resigned from the board of the Newall Engineering Company, Limited, Peterborough. Mr. Valdes will remain associated with the company; Mr. Summers has started business on his own account in Peterborough, where he is stated to be "working in very close connection with the company"; and Mr. Howard has commenced business in Birmingham, where he acts for the company.

MR. DAVID SKAE, repairs manager and a local director of Cammell Laird & Company, Limited, Birkenhead, has been elected to the board of Mountstuart Dry Docks, Limited, and appointed managing-director in succession to the late Mr. F. E. Shirley-Beavan. MR. J. H. EVANS continues as general manager. MR. WILLIAM LEON, chairman of Mountstuart Dry Docks and its associated companies, the Cardiff Channel Dry Docks & Pontoon Company, Limited, and the Barry Graving Dock & Engineering Company, Limited, has retired and will be succeeded by SIR WILLIAM REARDON SMITH, vice-chairman. SIR LLEWELLYN SOULSBY has been appointed vice-chairman.

New Patents

The following list of Patent Specifications accepted has been taken from the "Official Journal (Patents)." Printed copies of the full Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 1s. each. The numbers given are those under which the Specifications will be printed, and all subsequent proceedings will be taken.

604,148 SESSIONS, A. G. Vibrating machines for consolidating materials in moulds.

604,200 MADISON-KIPP CORPORATION. Method of casting metals.

604,325 PYRENE COMPANY, LIMITED, BARENT, M., and JOHNSON, S. W. Coating metals with phosphates.

604,379 FRANCHI, F. A. R. Process for the treatment of sheet iron.

604,457 LUMB, C. F. Production of heat-resistant coatings of metal on another metal.

604,484 TILGHMAN'S PATENT SAND BLAST COMPANY, LIMITED, and ANKERS, R. T. Centrifugal sand-blasting machines.

604,509 STEVENS, A. H. (Minerals Separation North American Corporation). Concentration of iron ores.

604,522 SMITH & COMPANY, WIRE MANUFACTURERS, LIMITED, F., and SETTERINGTON, J. T. Treatment of steel wire to render it suitable for further wire drawing.

604,538 GENERAL ELECTRIC COMPANY, LIMITED, JENKINS, I., and WILLIAMS, S. V. Surface carburisation of steel.

604,577 THOMPSON, G. H. Means for mechanically cleaning or fettling castings.

604,581 FERRO ENGINEERING COMPANY. Hot tops for ingot moulds.

604,591 CALLITE TUNGSTEN CORPORATION. Methods of making wire-drawing dies.

604,677 COMPAGNIE DE PRODUITS CHIMIQUES ET ELECTROMETALLURGIQUES ALAIS, FROGES & CAMARGUE. Method of manufacture of materials required in the electrometallurgy of aluminium.

604,768 MACKAY, C. Appliance for use in bending tubes or pipes and rods or bars.

604,792 ARNOLD, J. C. (Lester Engineering Company). Molten metal feeding device.

604,891 JAMES, W. E., and BRAYSHAW, B. Forming and hardening devices for leaf or blade springs.

605,070 HENLEY'S TELEGRAPH WORKS COMPANY, LIMITED, W. T., and SMITH, W. F. E. Plant for wire drawing.

605,203 PLASCO, LIMITED. Pressure die-casting machine.

605,261 BOART PRODUCTS, SOUTH AFRICA (PROPRIETARY), LIMITED. Manufacture of powder metal compacts and diamond tools.

605,436 INDIANA STEEL PRODUCTS COMPANY. Alloys of the aluminium-nickel-iron base type.

605,760 ELECTRIC FURNACE COMPANY, LIMITED (Ohio Crankshaft Company). Means and method for induction heating.

605,776 WESTINGHOUSE ELECTRIC INTERNATIONAL COMPANY. Apparatus for the heat-treatment of metal strip or other elongated metal member.

605,777 WESTINGHOUSE ELECTRIC INTERNATIONAL COMPANY. Apparatus for heat-treating metallic strip material, particularly tin-coated steel strip.

605,871 COLBERT, W. H., WEINRICH, A. R., and MORGAN, W. L. Strongly adherent metal-coated articles and means for producing the same.

605,872 COLBERT, W. H., WEINRICH, A. R., and MORGAN, W. L. Method of forming strongly adherent metallic compound film by glow discharge and articles resulting therefrom.

605,874 COLBERT, W. H., WEINRICH, A. R., and MORGAN, W. L. Method of forming an oxidised metallic compound coating.

605,909 BRITISH CAST IRON RESEARCH ASSOCIATION, MORROGH, H., and GARDNER, A. G. Manufacture of iron castings.

606,057 TENCONI, R., SOLLBERGER, W., and TENCONI, S. Quenching agent for the treatment of metals and process of its manufacture.

606,072 FOUNDRY SERVICES, LIMITED, and STRAUSS, K. Degassing and grain refining of magnesium and magnesium-base alloys.

606,117 TRAPP, G. J. Method of recovering hard metal carbides and bond metals from sintered masses.

606,119 FOUNDRY SERVICES, LIMITED, and STRAUSS, K. Moulding materials.

606,125 TRAUTMAN, O. C. Method of and apparatus for the heat-treatment of wire, strip, and like drawn material.

606,160 SOLVAY & CIE. Plastic deformation of metals in the cold.

606,381-2 WALTERISATION COMPANY, LIMITED, and WALTERS, W. I. Surface protection of metals.

Crompton Parkinson's Outlook

Chairman on Changing Conditions

Referring to the trading profit of the Crompton Parkinson group of companies for the year ended September 30, which at £1,687,968 was a record, Mr. Albert Parkinson, chairman, in a statement circulated with the annual report, says that it was the result of a year of record sales, combined with a higher degree of manufacturing efficiency. The future of the company is bound up with the future of the electrical industry, he says.

"We live to-day in a rapidly developing electrical age which seems likely to provide for many years to come an outlet for the products of an efficient British electrical industry. The improvement of industrial and commercial efficiency and of amenities in all phases of human capacity depends to a considerable extent on the generation, distribution and use of more electricity and at all points in this line the electrical industry has an important contribution to make."

Mr. Parkinson states that the company's main products may be classed as capital goods for which, as the order-book shows, there is still an unsatisfied demand. There is, however, a slackening of demand for some of the products that may be classified as consumer goods. "We are confident of our ability to maintain our position in the industry in whatever changing conditions may lie ahead."

News in Brief

A 12½-CWT. CASTING was flown from Newcastle-upon-Tyne recently for a ship at Cardiff.

MR. W. T. COWAN has been appointed a director of Bruntons (Musselburgh), Limited.

DURING 1948, the Hughes Bolckow Shipbreaking Company, Limited, Blyth, has broken up seven vessels.

THE AIRDRIE COMPANY of Robert Maitland & Son, ironfounders, has been acquired by Maitlands (Ironfounders), Limited, Airdrie.

PRELIMINARY ARRANGEMENTS in Cardiff to celebrate the Festival of Britain 1951 include a mobile pageant depicting the industrial activity of Wales.

THE COST to the British Iron & Steel Corporation (Ore), Limited, of manganese ore for the manufacture of blast-furnace manganese was increased to 30½d. per unit as from December 20 last.

BRITISH INSULATED CALLENDER'S CABLES, LIMITED, has formed a wholly-owned subsidiary (British Insulated Callender's Construction Company) to take over its civil engineering and cable contracts.

DORMAN, LONG & COMPANY, LIMITED, made history recently when for the first time it used its new link line to run hot metal from the Redcar blast furnaces to the Cleveland steelworks, a distance of about 3½ miles.

CLYDE CRANE & ENGINEERING COMPANY, Mossend, has received an order from Sweden valued at £35,000. The company already has a large amount of work in hand for Sweden, Holland, Turkey, and other overseas markets.

P. PLATTS & SONS, LIMITED, agricultural engineers, of Doncaster, is negotiating for a 4-acre factory site on the Wheatley Estate, Doncaster. The company plans to build a factory to employ between 200 and 250 workers.

CHEQUES FOR £50 to each of two employees, Mr. Frederick Schutt and Mr. Frederick Leadbeater, to mark the completion of 50 years' service with Crofts (Engineers), Limited, Thornbury, Bradford, were presented on December 22.

GUEST, KEEN & NETTLEFOLDS, LIMITED, has formed a new company (G.K.N. Group Services, Limited) for the purpose of administering and carrying on services for the group as a whole. Research will be included in the scope of its operations.

PALMERS HEBBURN COMPANY, LIMITED, has booked the reconditioning of the 5,452-ton cargo liner Takoradian, which was damaged by fire at Copenhagen. The cost of the work is estimated at £150,000 and will take three months to carry out.

THE FIRST British Diesel-electric main-line locomotive ever used in Egypt made its trial run from Cairo to Port Said on December 23. The 1,600-h.p. engine, designed and built by the English Electric Company, Limited, can pull a 500-ton train at 75 miles an hour.

HADFIELDS, LIMITED, Sheffield, reached its 1948 output target of special steels with more than a week in hand. Output for the year recently reached 120,000 tons. The British Iron and Steel Federation fixed 110,000 tons as the target at the beginning of the year and increased it later.

DR. N. E. RAMBUSH, managing director of the Power-Gas Corporation, Limited, Stockton-on-Tees, reveals in his annual report to the shareholders that the company received during last year export orders to the value of over £1,000,000 and has orders on the books for seven complete blast-furnace plants, two of which are for overseas.

MR. ALFRED EDWARDS, Independent M.P. for Middlesbrough East, who has been lecturing in America since September, is to start a lecture tour in Britain this month, at which he will campaign against the nationalisation of the steel industry. "I am going home to stop this nationalisation nonsense," he said before leaving New York.

THE NORTHERN REGION INDUSTRIAL SALVAGE ADVISORY COUNCIL is to intensify its drive for the recovery of scrap iron and steel. It is felt that, although most industrial concerns are readily co-operating in the disposal of ordinary day-to-day scrap, much more could be done by surveying the works and clearing out redundant machinery and other heavy items.

BRUSH ELECTRICAL ENGINEERING COMPANY, LIMITED, has received from John Brown & Company, Limited, Clydebank, an order for an alternator to be driven by the first closed-cycle gas turbine to be installed in the United Kingdom. The alternator will have an output of 12,500 kw., 0.85 power factor, 11,000 volts, 50 cycles, 3 phase, at 3,000 r.p.m., with exciter and closed-circuit air cooler.

IT IS REPORTED that Vickers-Armstrongs, Limited, has secured contracts for heavy engineering work which will ensure continuity of employment for the 2,500 workers at its Scotswood Works, Newcastle-upon-Tyne. When the British Railways Executive decided to terminate the repair and reconditioning of locomotives next March, it was feared that some employees would be discharged.

WITH A VIEW to combining duplicated departments, the North British Locomotive Company, Limited, Glasgow, has started extensive alterations at its Atlas Works. The cylinder department, at Queen's Park Works, Polmadie, Glasgow, is to be combined with that at the Mons establishment of the Atlas Works, while the wheel department at Mons is to be transferred to Queen's Park Works.

AS PART OF THE production efficiency drive which is being fostered by the Engineering Industries Association, a "help your neighbour" exhibition is to be held at the Seymour Hall, London, on January 18. The purpose of the exhibition is to give engineering firms in the London region the opportunity of seeing what neighbouring engineering firms manufacture, and what work they are capable of producing.

ABREU & ABRANTES, Lda., P.O. Box 1148, Lorenço Marques, is interested in securing representation of United Kingdom manufacturers of motor-cycle engines, copper wire, transmission line conductors and cables, water meters, etc., for the whole of Portuguese East Africa. Interested companies should contact the firm direct, at the same time notifying the Export Promotion Department, Board of Trade (reference, E.P.D. 42695/48), of any action taken.

AN OFFICIAL LIST of higher exchange rates governing Spanish imports shows increases ranging from 20 to 150 per cent. over the basic rates applicable in the past. The increases affect, *inter alia*, metals, special steels, machinery, machine tools, capital equipment, and precision instruments. Ferro-alloys, aluminium, nickel, manganese and cobalt are subject to a new rate of 61.78 pesetas per pound sterling (45 pesetas previously); and capital equipment, machinery, machine tools and special steels to that of 79.43.

A STATEMENT BY Mr. R. Cyril Thompson, a director of John Crown & Sons, Limited, Sunderland, that youths were reluctant to become riveters, as they considered it a dying trade, has brought a reply from Mr. F. W. Cook, Wear area delegate of the United Society of Boiler Makers and Iron and Steel Ship Builders. He said that boys were willing to enter the industry. Boys who began work as heaters and applied later to become riveters were refused the opportunity by the employers, because heaters were difficult to get. Higher wages for heaters was the only solution.

AT AN INQUIRY held by the Ministry of Town and Country Planning in Sheffield, recently, it was revealed that the works of Samuel Osborn & Company, Limited, steel and tool makers, of Wicker, Sheffield, are included in an area which the Corporation is asking the Ministry to declare liable for compulsory purchase. Other firms in danger of having their premises disturbed include G. & J. Hall, Limited, engineers' tool makers, Keeton, Sons & Company, Limited, sheet-metal working machinery makers, and William Walton (Sheffield), Limited, manufacturers of mining tools and drills.

TO HELP INDUSTRY in the South Wales Development Area, the Minister of Transport is putting in hand a scheme for building a new trunk road near Neath, Glam, at a cost of over £1 million. The road will connect with the new Jersey Marine Road, now nearing completion, which leads direct to the Swansea Docks area. Together, these two roads will shorten the present 12-mile journey between Briton Ferry and Swansea by roughly one half, and provide a splendid new highway for the heavy and growing industrial traffic between Cardiff and Swansea. The Cleveland Bridge & Engineering Company, Limited, Darlington, will carry out the work which is expected to take about 2½ years.

SIR ELLIS HUNTER, chairman and managing director of Dorman, Long & Company, Limited, has written a foreword to an illustrated brochure on the company's 1948 activities in which he says: "Keener competition in overseas markets is apparent and the British iron and steel industry can only hold its own abroad in important engineering activities if it is able to compete effectively in price as well as in design and service. No industry," he continues, "has made a greater contribution to national economic recovery in 1948 than iron and steel. Steelworks of Dorman, Long have played their part and new records of production have been achieved. We are all involved in the present struggle to secure our country's economic survival. Only by greater productivity can Great Britain surmount her great difficulties. New plant will avail little unless there is sustained effort by all concerned."

Amalgamation of B.O.T. Departments

Some weeks ago the President of the Board of Trade announced his decision to amalgamate the Commercial Relations and Treaties Department and the Export Promotion Department into a new department, to be known as the Commercial Relations and Exports Department. The objects of this change are to ensure that both trade policy and matters of trade promotion are the responsibility of a single department in the Board of Trade, that overlapping and underlapping alike are avoided and that there is the fullest and promptest use made of the information and advice available from oversea officers.

Broadly, the division of functions between these two departments is that the Commercial Relations and Treaties Department has been responsible for general external commercial policy and that the Export Promotion Department has been the executive instrument for fostering export trade, while it provides, in addition, information on which the Government's external commercial policy is based. No detraction from the functions of either department is contemplated. The change is simply an attempt to improve the service which the departments singly have been able to render to the Board and other branches of the Government and, of course, to industry.

The change took place on Saturday and the geographical sections are now at I.C. House (telephone: Whitehall 5140) and the industries branches and the reception and tours section at Thames House North (Victoria 9040). The exhibitions branch remains at Horseferry House (Victoria 6800). For the present at least these latter branches or sections will remain with the same structure and duties as previously, though they will all form part of the new combined Commercial Relations and Exports Department.

Increases of Capital

Details of increased capital have been announced by the following companies:—

HENLAW SPRINGS, LIMITED, Blackheath, Birmingham, increased by £9,000, in £1 ordinary shares, beyond the registered capital of £1,000.

STARTRITE ENGINEERING COMPANY, LIMITED, Chatham, increased by £4,000, in £1 ordinary shares, beyond the registered capital of £1,000.

SCANNERS, LIMITED, machinery manufacturers, etc., of Newcastle-upon-Tyne, increased by £10,000, in £1 unclassified shares, beyond the registered capital of £10,000.

ADDISON LAMB & COMPANY, LIMITED, toolmakers, electric welders, etc., of Hampton Wick, increased by £2,000, in £1 ordinary shares, beyond the registered capital of £1,000.

ROCHESTER WELDING & ENGINEERING COMPANY, LIMITED, Rochester, increased by £4,900, in £1 4% cumulative preference shares (tax free), beyond the registered capital of £100.

HILO ENGINEERING, LIMITED, London, S.W.1, increased by £4,000, in 2,000 5% participating preference and 2,000 ordinary shares of £1 each, beyond the registered capital of £1,000.

J. J. JOHNSTON (SOUTH AFRICA) PROPRIETARY COMPANY, LIMITED, mechanical engineers, etc., of London, S.W.1, increased by £50, in £1 ordinary shares, beyond the registered capital of £5,000.